

PARTS LIST AND DESCRIPTION (CONTINUED)

(When ordering parts, state Model, Part Number, and Description.)

Replacement parts shown may be superseded by the availability of newly introduced replacements. Have your local distributor check Sams COUNTER FACTS* for the most up-to-date replacement.

CRYSTALS

ITEM No.	CRYSTAL FREQUENCY IN MHz	MFGR. PART No.	CTS KNIGHTS PART No.	CHANNEL	ITEM No.	CRYSTAL FREQUENCY IN MHz	MFGR. PART No.	CTS KNIGHTS PART No.	CHANNEL
X801	11.0500	YEXLHC18U016	CA90W11050	Rec Osc	X902	10.2400	YEXLHC18U015		PLL
X901	10.5950	YEXLHC18U017	CB75W10595	Xmit osc					

MISCELLANEOUS

ITEM No.	PART NAME	PART No.	NOTES
CF151	Filter	YEIN09N5004	10.7MHz
CF152	Filter	YEIN09N5004	10.7MHz
CF801	Filter	YEIC07P2005A	455kHz
CF901	Filter	EFC527MT1	27MHz
CF902	Filter	YEIN09N50040	27MHz
M80	Tuner	YEAU01056	AM/FM
M801	Meter	YEAU01003	S/R
SW51	Switch	YEAS07042	DX/LOCAL
SW52	Switch	YEAS07042	AM/FM
SW701	Switch		Power (Part of Volume Control)
SW802	Switch	YEAS09061	Delta Tune (Part of Squelch Control)
SW803	Switch	YEAS09056	CB/Radio
SW904	Switch	YEAS10003	Monitor
SW905	Switch		CB Channel Selector

CABINETS & CABINET PARTS (When ordering specify model, chassis & color)

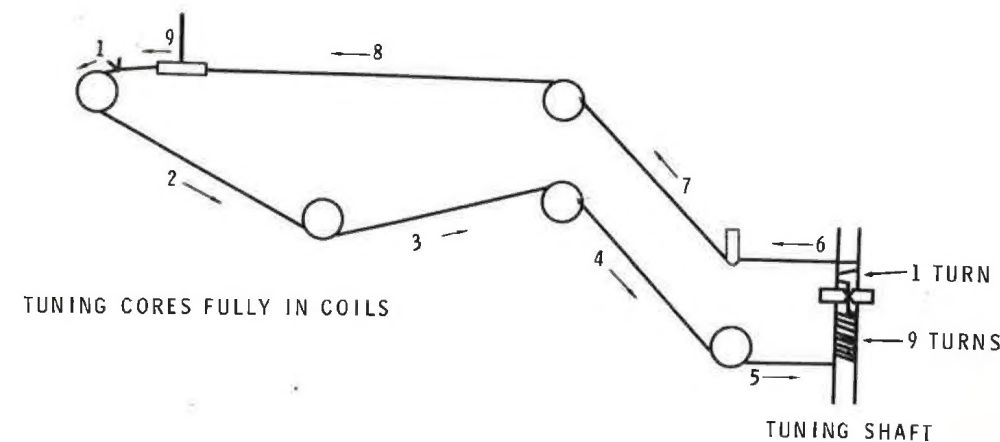
ITEM	PART No.	ITEM	PART No.
Escutcheon Assembly	YEF002378	Knob, Squelch	YEF007077
Cover, Top & Bottom	YEF003215	Knob, Delta Tune	YEF008071
Panel, Front	YEF007019	Knob, AM-FM	YEF017047
Panel, Rear	YEF008019	Knob, Tuning & Volume Control	YEF007063
Dial Pointer	YEF01145	Knob, Tone & Balance	YEF008057
Knob, CB Channel	YEF017048	Push Button, CB/Radio-DX/LOCAL	YEF010189

WIRING DATA

General-use Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 13 Colors
Shielded Antenna Lead	8524 (Stranded) Available in 13 Colors
	Use BELDEN No. 8214 Lowest-loss (RG-8/U Type)
	8237 Low-loss (RG-8/U)
	8240 (Solid) Miniature (RG-58/U)
Coiled Microphone Cable	8259 (Stranded) Miniature (RG-58A/U)
	Use BELDEN No. 8497 3-Conductor (1 shielded for Press-to-Talk) Neoprene
Bonding Strap	8491 4-Conductor (2 shielded, 2 unshielded) Neoprene
	Use BELDEN No. 8661 (3/8 inch)

DIAL CORD STRINGING

TOP VIEW



FRONT



PHOTOFACT® with

CIRCUITRACE®

For Supplier Address See PHOTOFACT Index

NOTE

Repair or adjustment of transmitter circuits must be under supervision of a person with first-or second-class radiotelephone license. (Refer to FCC Rules and Regulations Part 95, Subpart C & D.)

The frequency of the transmitter should be checked periodically with a secondary frequency standard to insure proper and legal operation.

Best results will be obtained when adjusting the final RF output circuit if the antenna normally used is connected and the chassis is as nearly in the cabinet as possible.

Connect either 50-ohm dummy load or the normally used antenna system.



MODEL Washington

HOWARD W. SAMS & CO., INC. Indianapolis, Indiana 46206

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ALIGNMENT INSTRUCTIONS

CAUTION: Use isolation transformer or observe polarity when connecting test equipment. Maintain line voltage at 120V AC. Allow a 15-minute warm-up period. Adjustments made with 13.8-volt DC input. Connect low sides of test equipment to ground unless specified otherwise. Connect 50-ohm dummy load or antenna before keying transmitter. Suggested Alignment Tools:

GC ELECTRONICS:
L27, L30, L32 5009
L1 thru L8, L16, L17, L24, L37, L39..... 9440
CT1 thru CT7 5000

SYNTHESIZER ALIGNMENT

TEST EQUIPMENT	TRANSCIEVER	ADJUST	REMARKS
Input of RF VTVM to TP6.	Ch. 1, AM Clarifier - Mid Range	L24	Adjust for maximum.
Input of DC meter to TP7.	Ch. 1,	L17	Adjust for 2.0 volts.
Input of RF VTVM to TP8.	Ch. 19	L16	Adjust for maximum.
Input of frequency counter to TP8.	Ch. 19	CT6	Adjust for 34.9850MHz \pm 20Hz.
Input of frequency counter to TP8.	Ch. 19, USB	CT4	Adjust for 34.9875MHz \pm 20Hz.
Input of frequency counter to TP8.	Ch. 19, LSB	CT5	Adjust for 34.9825MHz \pm 20Hz.
Input of frequency counter to TP8.	Ch. 19, LSB, Xmit	VR9	Adjust for 34.9825MHz \pm 20Hz.
Input of frequency counter to TP9.	Ch. 19, USB	CT2	Adjust for 7.8025MHz \pm 5Hz -0Hz.
Input of frequency counter to TP9.	Ch. 19, LSB	CT3	Adjust for 7.7975 +0Hz -5Hz.

RECEIVER ALIGNMENT

Connect an AC VTVM or AF wattmeter across speaker voice coil. Adjust volume control to obtain a suitable indication.

SSB

TEST EQUIPMENT	TRANSCIEVER	ADJUST	REMARKS
Output of signal generator thru .01uF to antenna jack. 27.186MHz, no modulation. Output .25uV.	Ch. 19, USB RF Gain - Max Clarifier - Mid Range Volume - Max.	L8, L7, L6, L5, L4, L3	Adjust for maximum output.
Output of signal generator thru .01uF to antenna jack. 27.186MHz, no modulation. Output .25uV.	Ch. 19	CT1	Adjust for .5 watts audio.

RECEIVER ALIGNMENT

Connect an AC VTVM or AF wattmeter across speaker voice coil. Adjust volume control to obtain a suitable indication.

AM

TEST EQUIPMENT	TRANSCIEVER	ADJUST	REMARKS
Output of signal generator thru .01uF to antenna jack. 23.5MHz, no modulation. Output 200uV. Input of RF VTVM to TP5.	Ch. 19, AM RF Gain - Max. NB-On	L1, L2	Adjust for maximum.

RECEIVER ADJUSTMENTS

Connect an AC VTVM or AF wattmeter across speaker voice coil. Adjust volume control to obtain a suitable indication.

TEST EQUIPMENT	TRANSCIEVER	ADJUST	REMARKS
Output of signal generator thru .01uF to antenna jack. 27.186MHz, no modulation. Output 250uV.	Ch. 19, USB RF Gain - Max Volume - Max	VR2	RF GAIN RANGE Adjust VR2 for .5 volts audio.
Output of signal generator thru .01uF to antenna jack. 27.186MHz, no modulation. Output 100uV.	Ch. 19	VR1	S METER Adjust for 9 on S scale of meter.
Output of signal generator thru .01uF to antenna jack. 27.186MHz, no modulation. Output 500uV.	Ch. 19	VR3	SQUELCH RANGE Set squelch control VR404 fully clockwise. Adjust VR3 so that squelch just breaks.
Output of signal generator thru .01uF to antenna jack. 27.185MHz, 1000Hz @ 30% No modulation. Output .5uV.	Ch. 19	VR5	AM BALANCE Adjust VR5 for .5 watts audio.

TRANSMITTER ALIGNMENT

Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector.

NOTE: Be sure to check transmit frequency and power on all active channels after alignment of transmitter. See Page 4 for channel frequencies.

SSB

TEST EQUIPMENT	TRANSCIEVER	ADJUST	REMARKS
Output of 2-tone generator to Mike input. 500Hz and 2400Hz at .5 volts.	Ch. 19, USB, Mike Gain - Max.	L39, L37, L32, L30	Adjust for maximum.
Output of 2-tone generator to Mike input. 599Hz and 2400Hz at .5 volts.	Ch. 19, LSB	CT7	Adjust CT7 for 11.5 watts.

TRANSMITTER ADJUSTMENTS

Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector.

NOTE: Be sure to check transmit frequency and power on all active channels after alignment of transmitter. See Page 4 for channel frequencies.

AM

TEST EQUIPMENT	TRANSCIEVER	ADJUST	REMARKS
Input of spectrum analyzer to antenna jack.	Ch. 19	L27	Adjust for MINIMUM at 54MHz.

TRANSMITTER ADJUSTMENTS

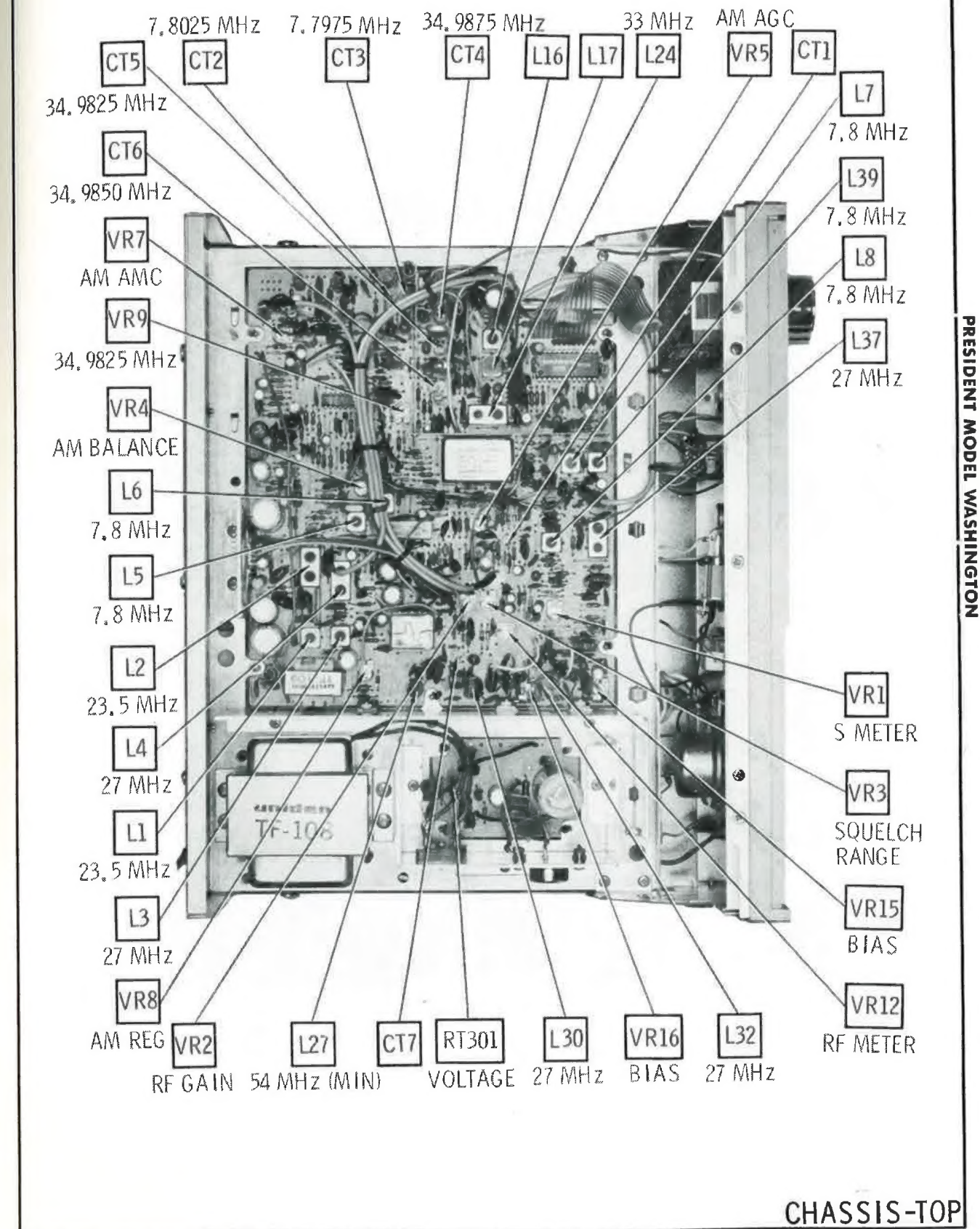
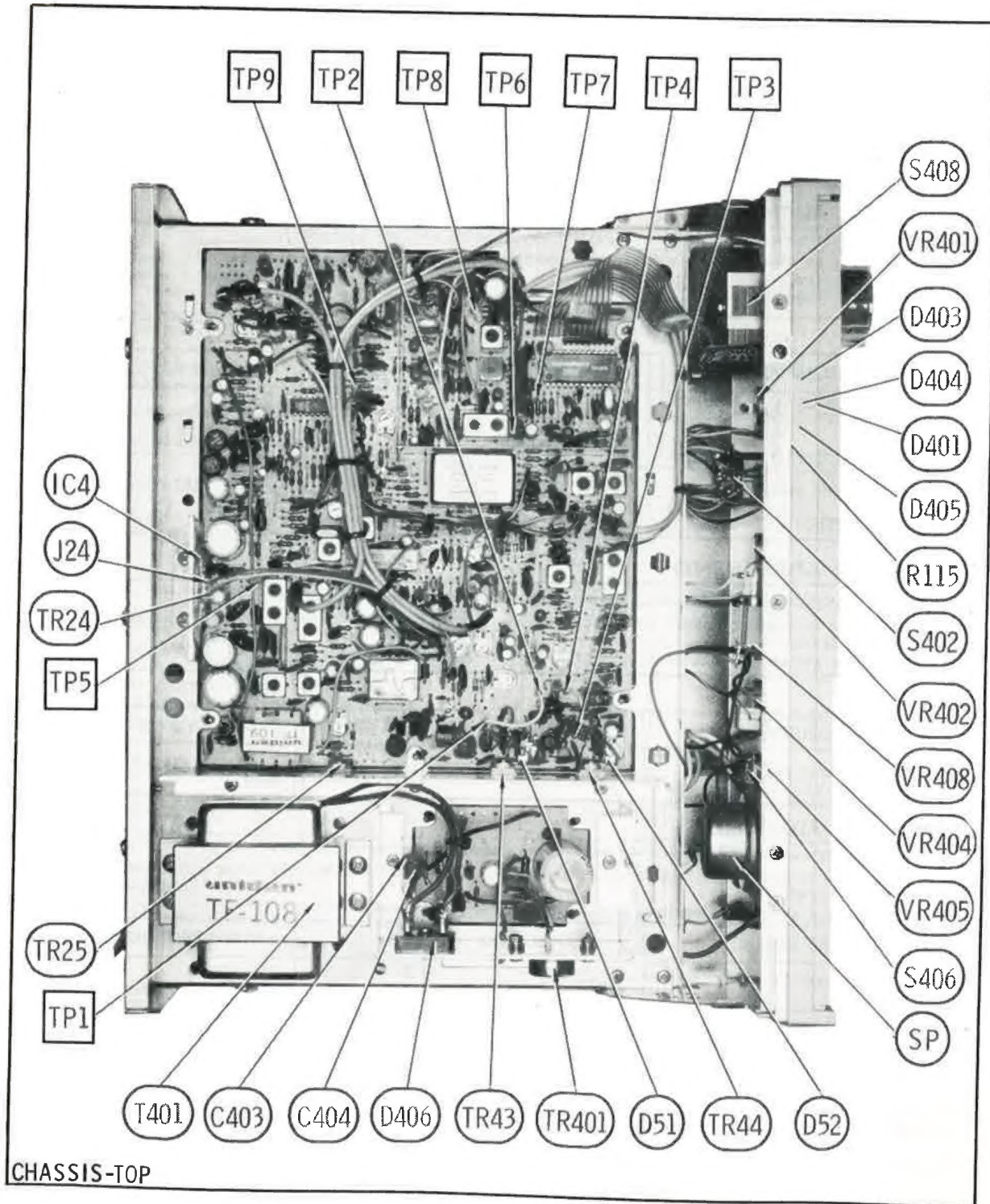
Connect an RF wattmeter and 50-ohm, 25-watt dummy load to antenna connector.

NOTE: Be sure to check transmit frequency and power on all active channels after adjustment of transmitter. See Page 4 for channel frequencies.

TEST EQUIPMENT	TRANSCIEVER	ADJUST	REMARKS
Input of DC meter to TP10.	Ch. 19	RT301	VOLT REG Voltage should not vary when keying transmitter.
DC current meter to TP3 and TP4. No modulation.	Ch. 19, USB	VR15	BIAS Adjust VR15 for 40mA \pm 10mA
DC current meter to TP1 and TP2. No modulation.	Ch. 19, USB	VR16	BIAS Adjust VR16 for 70mA \pm 10mA.
No Modulation	Ch. 19, USB	VR4	BALANCE Adjust for MINIMUM RF.

TRANSMITTER ADJUSTMENTS (Continued)

TEST EQUIPMENT	TRANSCIEVER	ADJUST	REMARKS
No Modulation	Ch. 19, AM	VR8	AM REG Adjust VR8 for 3.8 watts.
No Modulation	Ch. 19, AM	VR12	RF PANEL METER Adjust VR12 for 3.8 watts on on RF scale of meter.
Modulation meter to antenna jack.	Ch. 19, AM. AMC-MAX	VR7	AM AMC Adjust signal for 50% modulation. Increase signal 630 times. Adjust VR7 for 95% modulation.

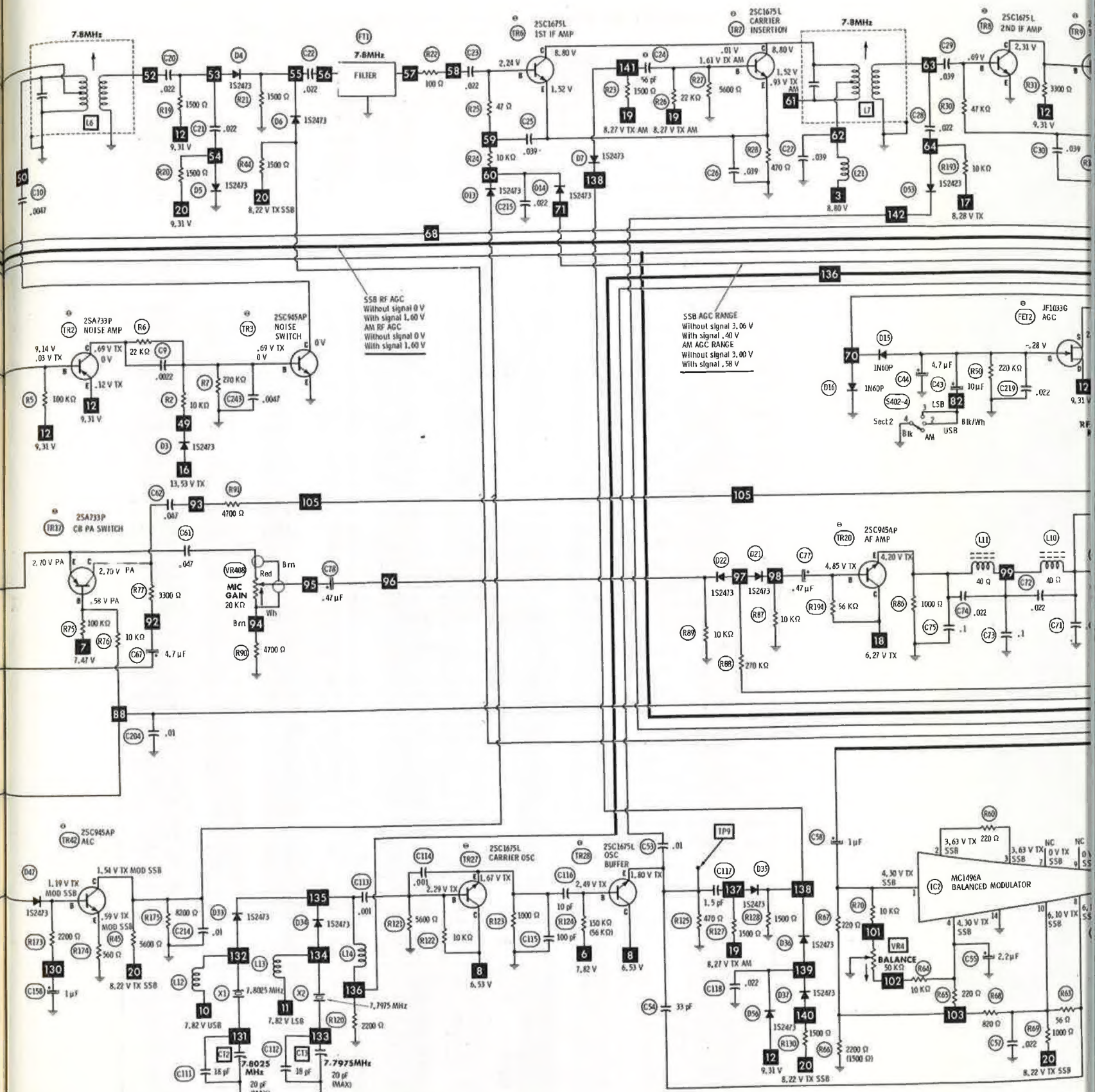
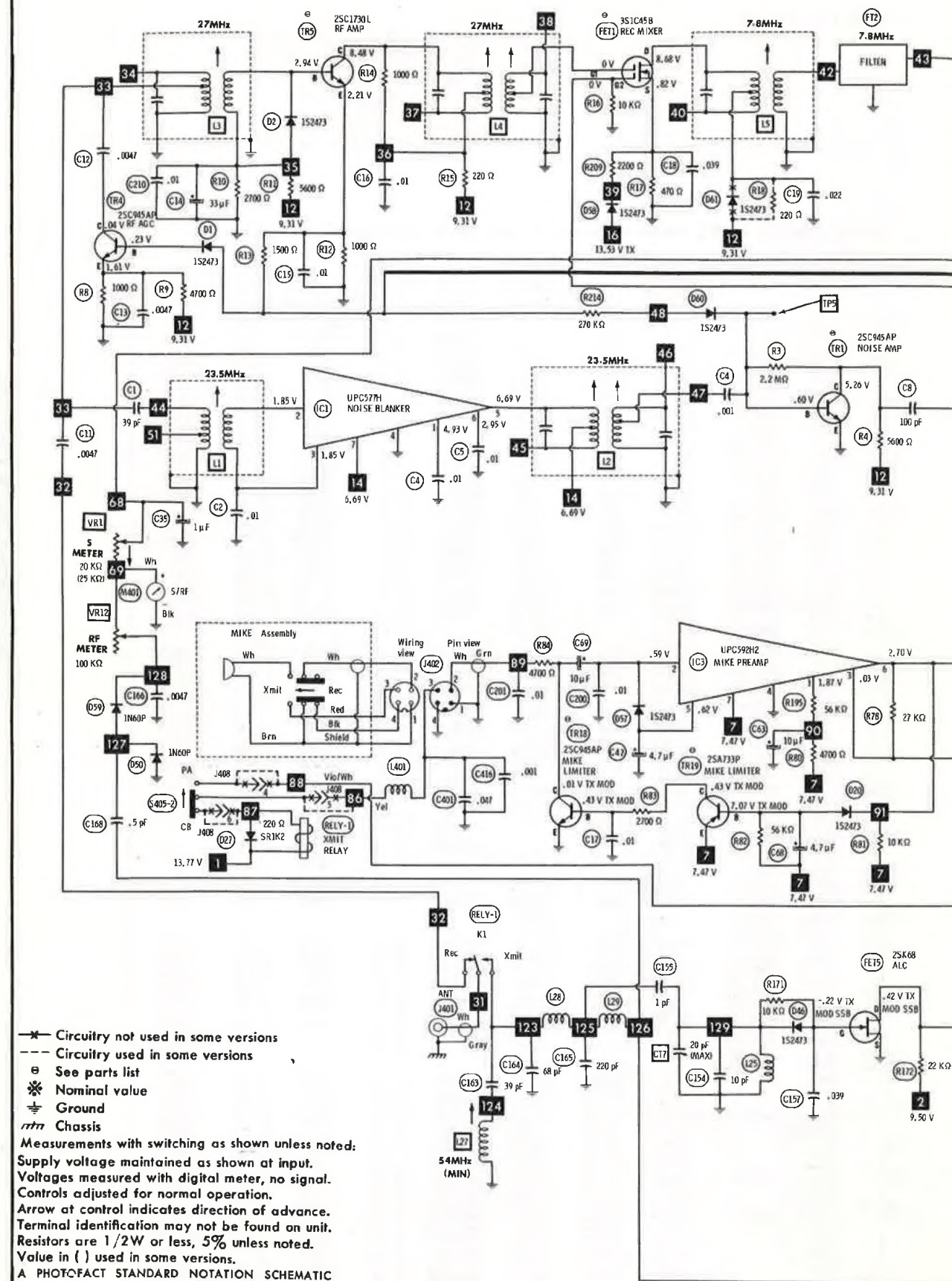




(When ordering parts, state Model, Part Number, and Description.)

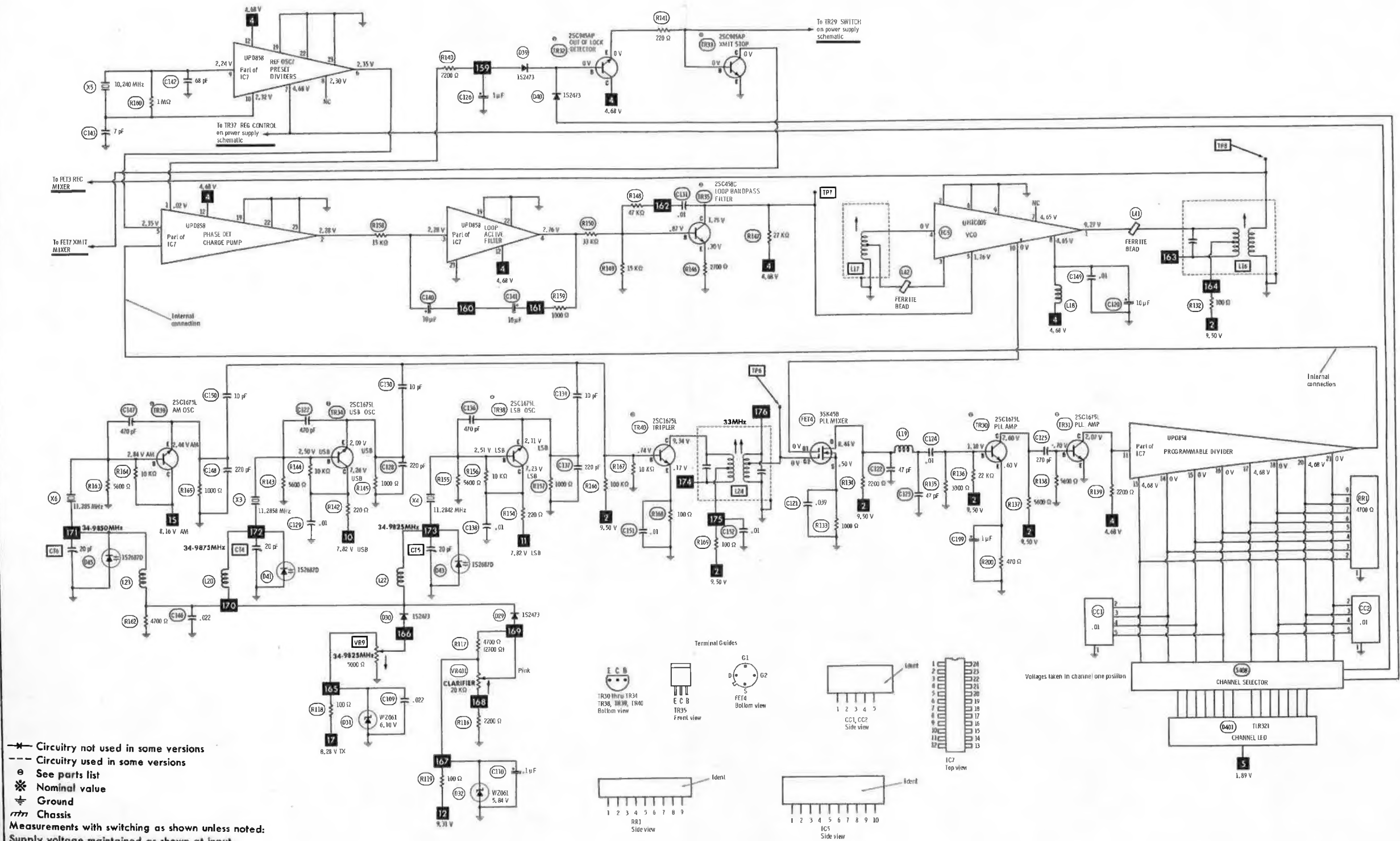
General-use Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in 13 Colors 8524 (Stranded) Available in 13 Colors
Power Cord, 2-Wire	Use BELDEN No. 17106 (Plastic) -6 feet 17109 (Plastic) -9 feet
Shielded Antenna Lead	Use BELDEN No. 8214 Lowest-loss (RG-8/U Type) 8237 Low-loss (RG-8/U) 8240 (Solid) Miniature (RG-58/U) 8259 (Stranded) Miniature (RG-58A/U)
Coiled Microphone Cable	Use BELDEN No. 8497 3-Conductor (1 shielded for Press-to-Talk) Neoprene

ITEM No.	TYPE No.	MFG. PART No.	REPLACEMENT DATA							
			GENERAL ELECTRIC PART No.	IR WORKMAN PART No.	MALLORY PART No.	MOTOROLA PART No.	RAYTHEON PART No.	RCA PART No.	SPRAGUE PART No.	SYLVANIA PART No.
D1	1S2473	2000-317	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519
D2	1S2473	2000-317	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519
D3	1S2473	2000-317	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519
D4	1S2473	2000-317	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519
D5	1S2473	2000-317	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519
D6	1S2473	2000-317	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519
D7	1S2473	2000-317	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519
D8	1S2473	2000-317	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519
D9	1S2473	2000-317	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519
D10	1N60P	2000-318	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D11	1N60P	2000-318	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D12	1S2473	2000-317	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519
D13	1S2473	2000-317	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519
D14	1S2473	2000-317	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519
D15	1N60P	2000-318	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D16	1N60P	2000-318	1N60	1N60	PTC206	HEPR9135	RE 47	SK3088	RT-263	ECG109
D17	1S2473	2000-317	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519
D18	1S2473	2000-317	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519
D19	1S2473	2000-317	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519
D20	1S2473	2000-317	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519
D21	1S2473	2000-317	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519
D22	1S2473	2000-317	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519
D23	1S2473	2000-317	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519
D24	CZ092	2000-327	GEZD-9.1	Z1209	ZB9.1A	HEPZ0412	RE 114	SK3060	RT-240	ECG139
D25	BZ075	2000-324	GEZD-7.5		ZB7.5B	HEPZ0412	RE 111		RT-239	ECG138
D26	WZ050	2000-321	GEZD-5.1						RT-235	
D27	SR1K2	2000-320	GE-504A	5A4D	PTC201	HEPR0052	RE 49	SK3030	RT-213	ECG116
D28	CZ092	2000-327	GEZD-9.1	Z1209	ZB9.1A	HEPZ0412	RE 114	SK3060	RT-240	ECG139
D29	1S2473	2000-317	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519
D30	1S2473	2000-317	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519
D31	WZ061	2000-329	GEZD-6.2		ZB6.2B		RE 109		RT-237	ECG137
D32	WZ061	2000-329	GEZD-6.2		ZB6.2B		RE 109		RT-237	ECG137
D33	1S2473	2000-317	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519
D34	1S2473	2000-317	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519
D35	1S2473	2000-317	GE-300	D200	PTC214	HEPR0602	RE 52	SK3100	RT-218	ECG519
D36	1S2473									



SEMICONDUCTOR

ITEM No.	TYPE No.	MFG PART
FET6	2SK300A(1) JF1033G	2000-10
FET7	2N4233B(1) 2SK19 (1) 2SK33 (1)	2000-10
IC1	3SK45B (1) UPC577M	2000-00
IC2	MC1496A UC1496A	2000-00
IC3	LM1496N(1) UPC592H2	2000-00
IC4	UPC1156H	2000-00
IC5	UHC005	2000-01
IC6	UPC78L05	2000-00
IC7	UPD858 UPD858C KMS58C(1)	2000-00
TR1	2SC945AP	2000-21
TR2	2SA733P	2000-21
TR3	2SC945AP	2000-21
TR4	2SC945AP	2000-21
TR5	2SC1730L	2000-21
TR6	2SC1675L	2000-21
TR7	2SC1675L	2000-21
TR8	2SC1675L	2000-21
TR9	2SC1675L	2000-21
TR10	2SC1675L	2000-21
TR11	2SC945AP	2000-21
TR12	2SC945AP	2000-21
TR13	2SC945AP	2000-21
TR14	2SC945AP	2000-21
TR15	2SC945AP	2000-21
TR16	2SC945AP	2000-21
TR17	2SA733P	2000-21
TR18	2SC945AP	2000-21
TR19	2SA733P	2000-21
TR20	2SC945AP	2000-21
TR21	2SC945AP	2000-21
TR22	2SC945AP	2000-21
TR23	2SC945AP	2000-21
TR24	2SC1419B	2000-21
TR25	2SC1419B	2000-21
TR26	2SC945AP	2000-21
TR27	2SC1675L	2000-21
TR28	2SC1675L	2000-21
TR29	2SC945AP	2000-21
TR30	2SC945AP	2000-21
TR31	2SC1675L	2000-21
TR32	2SC1675L	2000-21
TR33	2SC945AP	2000-21
TR34	2SC945AP	2000-21
TR35	2SC1675L	2000-21



— Circuitry not used in some versions
- - - Circuitry used in some versions
e See parts list
* Nominal value
⊥ Ground
Chassis

Measurements with switching as shown unless noted:
Supply voltage maintained as shown at input.
Voltages measured with digital meter, no signal.
Controls adjusted for normal operation.
Arrow at control indicates direction of advance.
Terminal identification may not be found on unit.
Resistors are 1/2W or less, 5% unless noted.
Value in () used in some versions.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
WITH CIRCUITTRACE™

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PRESIDENT MODEL WASHINGTON